FACULTY OF VETERINARY MEDICINE
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Multiresistant *Gallibacterium anatis* in a clinical outbreak of infectious bronchopneumonia in beef cattle

*Laura Van Driessche[1], Lieze De Cremer[1], Katharina van Leenen[1], Jade Bokma[1], Linde Gille[1], Piet Deprez[1], Filip Boyen[2], Bart Pardon[1]

1.Department of Large Animal Internal Medicine, Faculty of Veterinary Medicine, Ghent University - Merelbeke (Belgium)
2.Department of Pathology, Bacteriology and Avian Diseases, Faculty of Veterinary Medicine, Ghent University - Merelbeke (Belgium)

Laura.vandriessche@ugent.be

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Introduction

- Infectious bronchopneumonia:

  - ✓ Major economical impact in cattle production systems worldwide
  - ✓ Bacterial pathogens: *Pasteurella multocida*, *Histophilus somni*, *Mannheimia haemolytica*, *Mycoplasma bovis*
  - ✓ Leading cause antimicrobial use in calves
  - ✓ ↗ Pressure intensive antimicrobial consumption food producing animals

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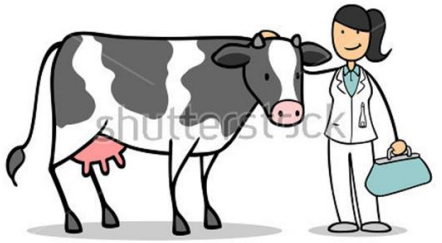
Introduction

- Reduction and rational antimicrobial use
  => TOP PRIORITY!
- Formularies
  - ✓ 1st choice products
  - ✓ Certain classes: identification and susceptibility test requested



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Introduction

- Sampling: non-endoscopic bronchoalveolar lavage (BAL)

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Introduction

Gallibacterium anatis:

- Genus within *Pasteurellaceae*
- Chickens:
  - ✓ opportunistic pathogen upper respiratory tract, lower genital tract
  - ✓ salpingitis and peritonitis, ↘ egg production, ↗ mortality
- Humans:
  - ✓ severely immunocompromised individuals
  - ✓ sepsis

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Case report

Describe a clinical outbreak of infectious bronchopneumonia in beef calves associated with multiresistant *Gallibacterium anatis* strains

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Anamnesis

- 6 different beef herds suffering from infectious bronchopneumonia (2017-2018)
- 9 calves:
  - ✓Aged 22 days-4 months
  - ✓5 calves presented at 2 different farms (farm 1: 4; farm 2:2) suffering from an acute clinical outbreak of infectious bronchopneumonia
  - ✓4 calves from different herds presented at the clinic with signs of infectious bronchopneumonia

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Clinical signs

- 9 calves:
  - ✓Fever (>39,3°C), cough, nasal discharge, auscultation and ultrasound: pneumonia

  - ✓4 calves presented at the clinic: no improvement with first-second line antimicrobials (penicillin, trimethoprim-sulphonamides, tetracycline, ampicillin)

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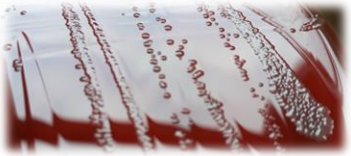
Diagnosis

- Non-endoscopic BAL
- Identification:
  - ✓Columbia blood agar + PPLO broth
  - ✓MALDI-TOF MS
  - ✓16S rRNA gene sequencing
  - ✓1 herd with clinical outbreak (4 calves): PCR



Corona	PI3	BRSV	
Histophilus somni	*Mannheimia haemolytica*	*Pasteurella multocida*	*Mycoplasma bovis*

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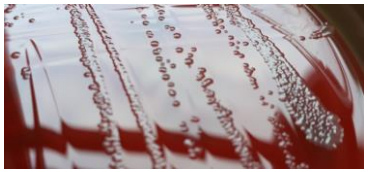
Results



- Identification: *Gallibacterium anatis*
  - ✓MALDI-TOF MS: score >2.0
  - ✓16S rRNA gene sequencing: 94-99% identification
  - ✓6 pure cultures
  - ✓1 dominant culture + *Trueperella pyogenes*
  - ✓2 polybacterial cultures with *G. anatis*
  - ✓No isolation *Mycoplasma bovis*
  - ✓PCR: positive for

PI3	Corona
Histophilus somni	*Pasteurella multocida*

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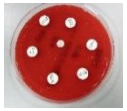
Diagnosis

- Susceptibility testing:



✓Disk diffusion: Ceftiofur

✓MIC-gradient strip test: Amoxicillin-clavulanic-acid, Doxycycline, Enrofloxacin

✓Broth-dilution:

Ampicillin	Florfenicol	Gentamycin
Oxytetracycline	Penicillin	Spectinomycin
Tilmicosin	Trimethoprim-Sulfamethoxazole	Tulathromycin
Tylosin		

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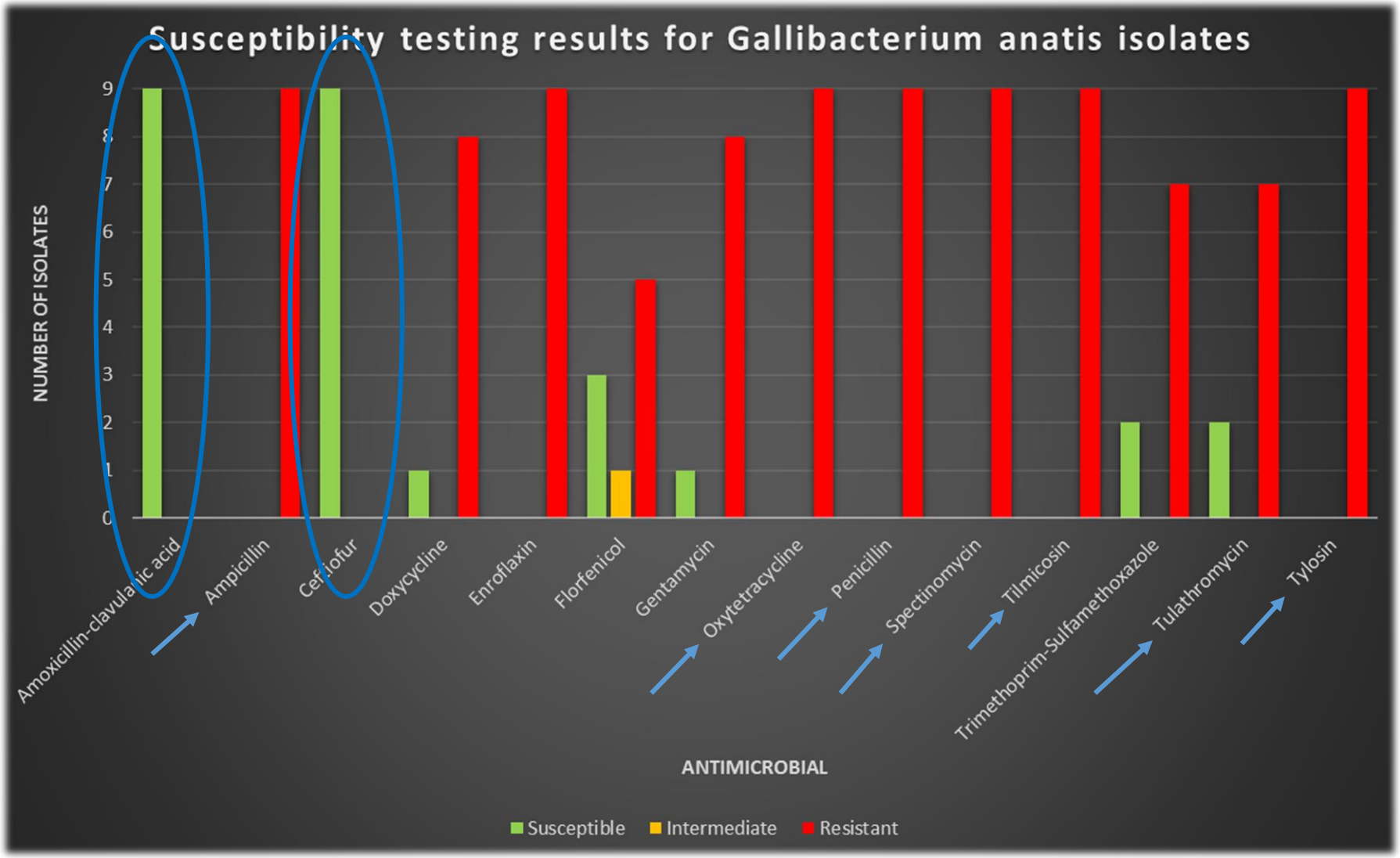
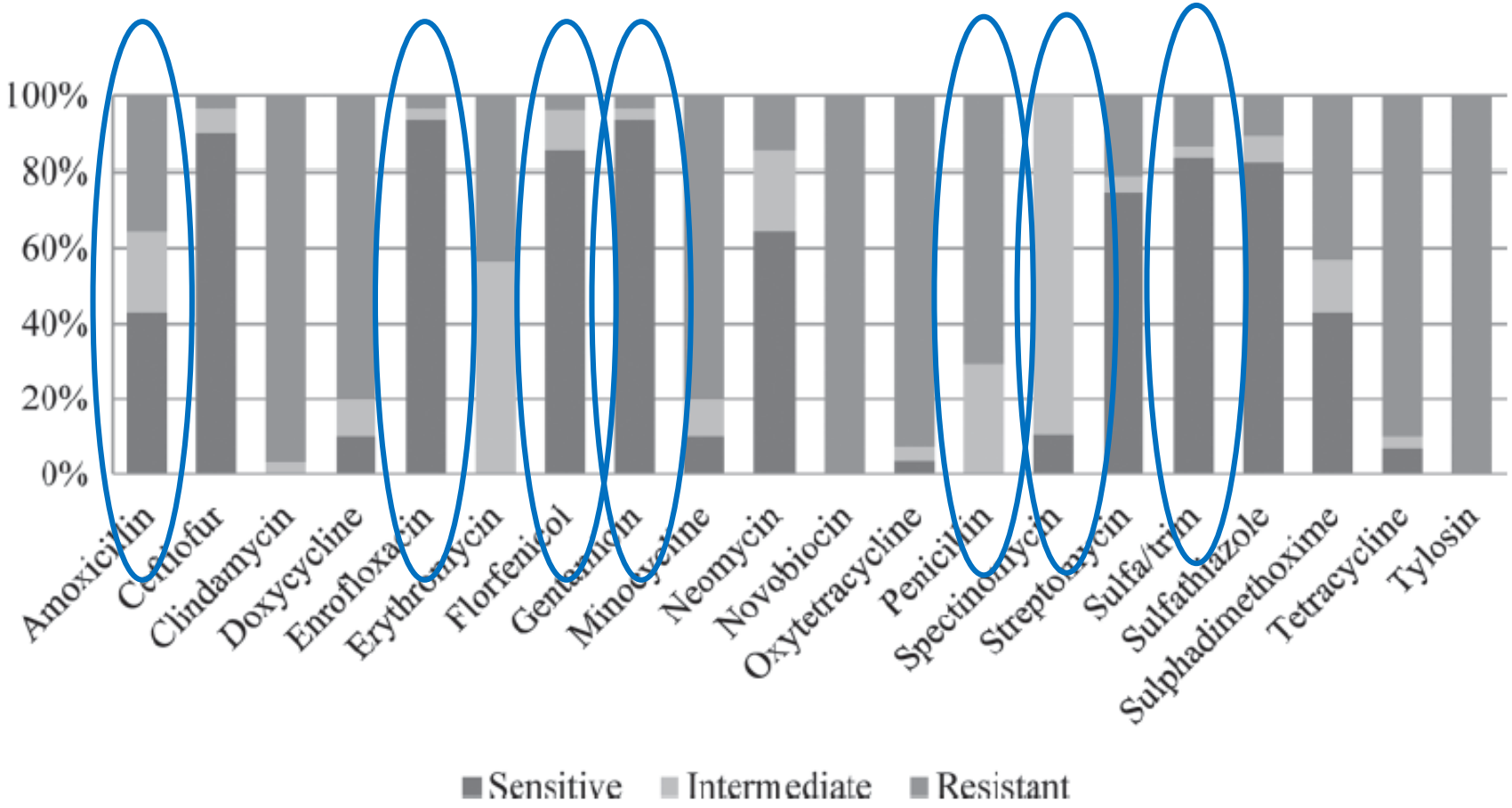
Results


Susceptibility testing results for Gallibacterium anatis isolates
NUMBER OF ISOLATES
0
1
2
3
4
5
6
7
8
9
Amoxicillin-clavulanic acid
Ampicillin
Ceftiofur
Doxycycline
Enroflaxin
Florfenicol
Gentamycin
Oxytetracycline
Penicillin
Spectinomycin
Tilmicosin
Trimethoprim-Sulfamethoxazole
Tulathromycin
Tylosin
ANTIMICROBIAL
Susceptible
Intermediate
Resistant

Comparison with isolates from chickens



From: Jones et al., 2013

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Comparison with isolates from chickens

- 65% of the isolates are multidrug resistant

  - ✓ ↘ Susceptibility against 4-9 antimicrobials
  - ✓Especially sulfamethoxazole, tetracycline, tylosin, lincosamide, penicillin (El-Adawy, 2018; Bojesen, 2011; Jones, 2013)

- Isolates retrieved from calves:

  - ✓100% multidrug resistant (minimum of 6 antimicrobial classes)
  - ✓Only susceptible for amoxicillin-clavulanic acid and ceftiofur

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Conclusion

- ***Gallibacterium anatis*** could play a role in **infectious bronchopneumonia** in **calves**

- **Multiresistance** is frequent in *Gallibacterium anatis,* potentially causing **therapy failure**

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Discussion

- *Gallibacterium anatis* already described in cattle (joint, unknown origin: Christensen, 2003), first time associated with clinical outbreak

- Secondary pathogen causing pneumonia associated with viruses (f.e. Moraxella ovis, Catry, 2006)?

- No clinical breakpoints, interpretation susceptibility testing?

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Acknowledgement







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Thank you for your attention